SECTION 8

Clutch

INDEX

8A DUAL CLUTCH

Part A

Dual Clutch

Table of Contents

Operation No.	Description	Page No.
8A.1	Specification	8A - 3
8A.2	General Description	8A - 4
8A.3	Clutch Pedal Free Play	8A - 5
8A.4	PTO Clutch	8A - 5
8A.5	Dual Clutch Assembly	8A - 6
8A.6	Clutch Release Bearing	8A - 8
8A.7	Clutch release mechanism	8A - 9
8A.8	Fly wheel pilot bearing	8A - 10
8A.9	Fault finding chart	8A - 10

8A. 1 SPECIFICATION

Clutch Primary Plate Diameter	:	12 inch (305 mm)
Clutch Secondary Plate Diameter	:	10 inch (254 mm)
Clutch Disc thickness – Primary plate	:	0.362 inch (9.22 mm)
Clutch Disc thickness – Wear tolerance	:	0.098 inch (2.50 mm)
Clutch Disc thickness – Secondary Plate	:	0.314 inch (8 mm)
Clutch Disc thickness – Wear tolerance	:	0.078 inch (2 mm)
Primary Pressure plate Coil Spring	:	For MF 2605 - 6 Springs
	:	For MF 2615 - 9 Springs

Special Tools

SER / 054	:	Tractor Split kit
SER / 011	:	Clutch Centraliser
SER / 081	:	PTO Clutch Setting Gauge
SER / 006	:	Release Lever height gauge (12 inch).
SER/168	:	Clutch dismantling / assembling tool
SER/053	:	Clutch remover / assembly fixture
SER/081	:	PTO Clutch setting gauge.

Torque Values

Clutch cover to flywheel	:	30 Nm (22 lbs. ft.)
Transmission case to engine	:	75 Nm (55 lbs. ft.)
Clutch adjusting set screw	:	27 – 37 Nm (20 – 27 lbf ft.)
Fly wheel bolts	:	100 Nm (74 lbs.ft)

Recommended Lubricants for Smearing Clutch Splines

Make		**Type**
SHELL	:	Retinax OX
GULF	:	High temperature Grease No. 3
ESSO	:	Univex N3
CASTROL	:	BNS
BP	:	Energrese HTB2 or B2
TOTAL	:	Exteup or Coloris 3

8A. 2 GENERAL DESCRIPTION

Dual Clutch (Fig. 1)

The dual clutch enables the drive to the gearbox and rear wheels to be disconnected without interrupting the drive shaft to the linkage pump and power take off which remains “live”. The clutch second stage allows for disconnection of the drive to the PTO and hydraulics. During operation, the main friction disc (22) is held against the engine flywheel by the main pressure plate (2) under the force of coil springs (11). The PTO friction disc (21) is held against a false flywheel (19) by the PTO pressure plate (3) under the force of a Belleville spring disc (12).

Depressing the clutch pedal through its first stage of travel causes the release bearings to move three release levers which are pivot mounted to the clutch cover. Movement of these levers pulls the main pressure plate (2) rearwards against the force of coil springs and so disengages the drive from the main friction disc (22).

Depressing the clutch pedal into the second stage brings setscrews on the main pressure plate (2) into contact with the PTO pressure plate (3). Further pedal movement forces the PTO pressure plate (3) rearwards against the force of its Belleville spring and disengages the main drive from the PTO friction disc (21) to the pump and PTO.

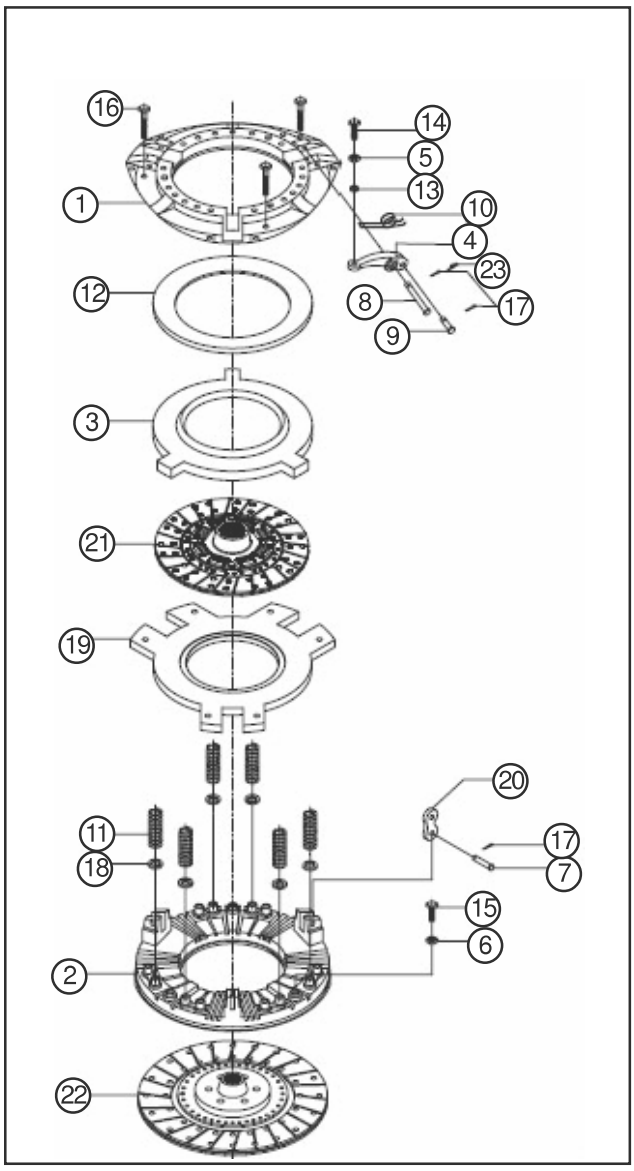


Fig 1

1. Cover plate
2. Pressure plate main
3. Pressure plate PTO
4. Release lever
5. Hex.nut on lever
6. Hex nut on Pressure Plate
7. Release levers pin pressure plate link
8. Release lever pin (link lever)
9. Release lever pin (lever cover)
10. Anti rattle spring
11. Pressure spring
12. Belleville spring
13. Spring washer
14. Adjusting screw
15. Release screw
16. Transporation screw
17. Split pin
18. Insulator
19 . Secondary fly wheel (False fly wheel)
20 . Link
21. Driven plate (PTO)
22. Driven plate (Main drive)
23 . Hair pin spring

8A. 3 CLUTCH PEDAL FREE PLAY

Adjustment

1. Slacken the clamp bolt (Item 1 in Fig. 2) and insert a pry bar in the hole at the end of the clutch operating shaft (Item 2 in Fig. 2).
2. Insert the 4mm wedge in between the clutch pedal lever and the stopper plate (Ref Fig 2A).
3. Rotate the clutch operating shaft clockwise, until resistance is felt and re-tighten the clamp bolt (Item 1 in Fig. 2) by holding the pry bar in same position.
4. Remove the pry bar and the wedge and this will give a free travel of 25 mm (1 inch) in the clutch pedal pad.
5. Press the clutch pedal down through full travel five times. Check the free travel again and re-adjust, if necessary.

   NOTE : *It is essential that the stop plate is fitted correctly as follows*

   Clutch pedal free play should be

   Split torque clutch - 25 mm (1 inch)

   Dual clutch - 16 mm (0.629 inch)

   Check the clutch adjustment every 100 hours.

   When the tractor enters service or has new clutch linings fitted, the clutch must be carefully bedded in. The clutch pedal play must be checked frequently during the first 50 hours and necessary adjustments should be made immediately. Subsequent checks must be made at 100 hours intervals.

   NOTE : *Adjust the clutch stopper bolt for effective function of single stage clutch.if necessary.(Refer fig 2B)*

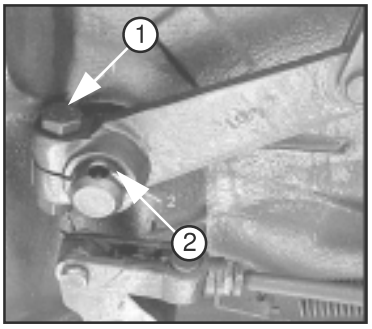


Fig 2

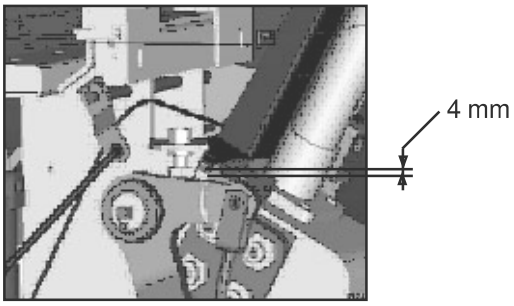


Fig 2A

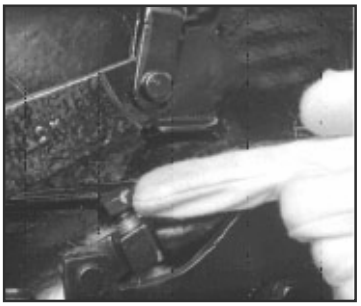


Fig 2B

8A. 4 PTO CLUTCH

Adjustment

WARNING: disconnect the battery terminals and apply parking brake before undertaking adjustment work.

1. Remove the inspection cover from the under side of the clutch housing.
2. Rotate the engine flywheel until one of the three adjusters is visible through the inspection cover opening.
3. Check the gap between screw and PTO clutch pressure plate. If required, adjust the gap to 0.080 ± 0.002 inch (2.032 +/- 0.050 mm)(Dimension 'A' in Fig 3) by slackening the nut and then retighten it.
4. Carryout the above steps for remaining two adjusters and refit the inspection cover.

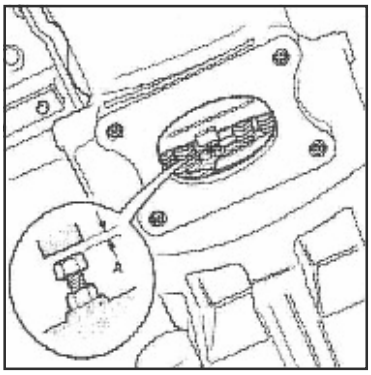


Fig 3

8A. 5 DUAL CLUTCH ASSEMBLY

Removal and Refitment

Special Tools

SER / 011	:	Clutch Centraliser
SER/081	:	P.T.O. Clutch Setting Gauge
SER / 006	:	Lever Height Setting Gauge

CAUTION: The following sequence of instructions must be followed carefully, as spring pressure will cause the clutch cover to fly apart if pressure is not released slowly and evenly.

Removel Sequence

1. Split the tractor between the engine and the Transmission.
2. Fit three slave bolts ¼" UNC x 54 mm (2 1/8 in) to the three equi-spaced holes in the clutch cover and tighten. (Item 2 in Fig. 4)
3. Locate clutch centraliser SER / 011 (Item 8 in Fig. 4) on to the clutch plate hubs and progressively slacken and remove the six bolts and washers. (Item 3 in Fig. 4)
4. Lift the clutch assembly clear of the flywheel. The main friction disc (Item 5 in Fig. 4) will remain separate from the clutch assembly.

Refitment Sequence

1. Lightly smear the splines of the friction disc with recommended grease.
2. Locate the main friction disc on the flywheel. (Item 5 in Fig. 4)
3. Position the clutch assembly on the Flywheel.
4. Using SER / 011 Centralise the PTO clutch and the main friction disc. (Item 8 in Fig. 4)
5. Refit the six bolts and washers. Torque to 30 Nm (22 lbs. ft.). (Item 3 in Fig. 4)
6. Remove the three slave bolts (Item 2 in Fig. 4) progressively and then remove SER / 011

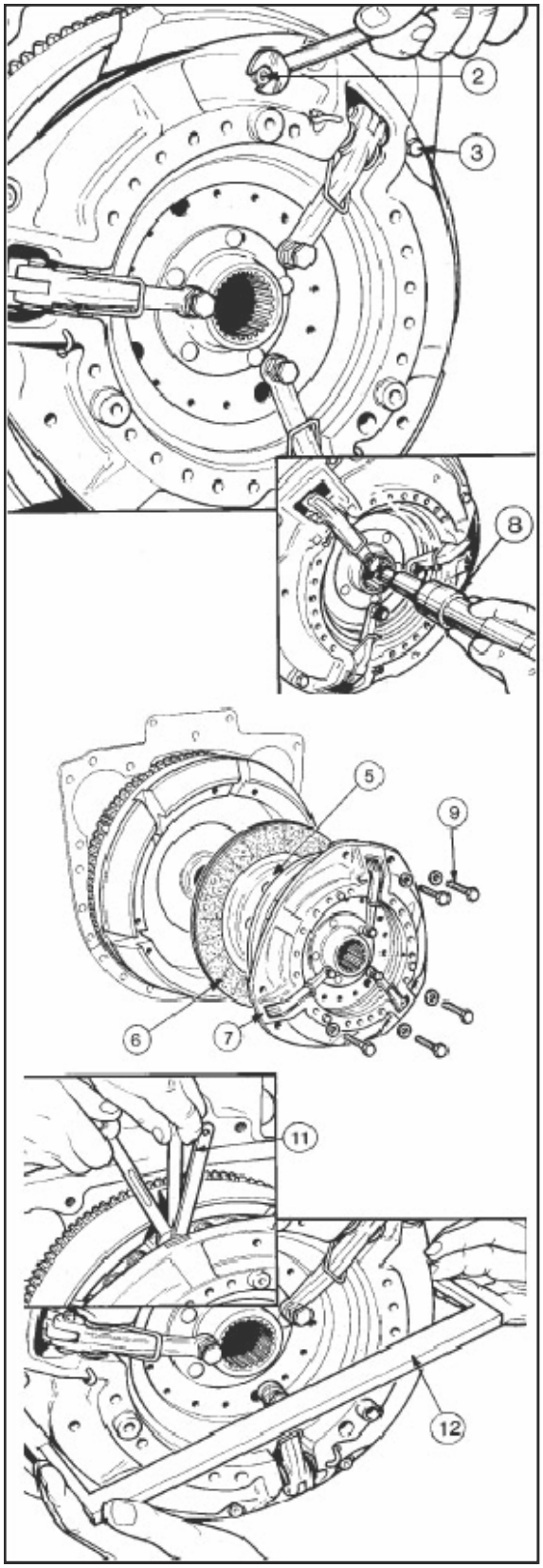


Fig. 4

7. Using SER/081 (Item 11 in Fig. 4), check the clearance between the PTO clutch adjusting setscrews and the PTO pressure plate. Adjust the setscrews as required to 0.080 inch ± 0.002 inch (2.032 ± 0.050 mm). Retighten the locknuts.
8. Using SER / 006 (Item 12 in Fig. 4), check the adjustment of release lever. The domed end of each of the release lever set screw must just touch the gauge. Adjust the set screws as required and re-tighten the locknuts.
9. Join the engine to the rear half of the tractor to complete the assembly.
10. Adjust the clutch pedal free play.

Overhaul

Special Tools:

SER / 011 : Clutch Centraliser

SER/081 : P.T.O. Clutch Setting Gauge

SER / 006 : Lever Height Setting Gauge

SER/053 : Clutch remover / Assembly fixture

Dis-assembly

1. Remove the clutch assembly.
2. Mark all following components to permit their refitment in the same relative positions.

   Cover plate, PTO pressure plate, false flywheel and main pressure plate.
3. Place the clutch assembly on a hydraulic press and locate a suitable bar on top of the cover. (Fig. 5)

WARNING : Ensure that the clutch is located under the press correctly that the bar will not slip and that the press has sufficient travel to allow the spring pressure to completely release. Release the pressure evenly and slowly.

4. Apply pressure until the three 1/4 UNC x 2 1/8 inch long slave bolts can be easily removed. (Item 4 in Fig. 6).
5. Remove the retaining clips from the pivot pins. (Item 5 in Fig. 6).
6. Remove the pivot pins. (Item 6 in Fig. 6).
7. Remove the lever springs. (Item 7 in Fig. 6).

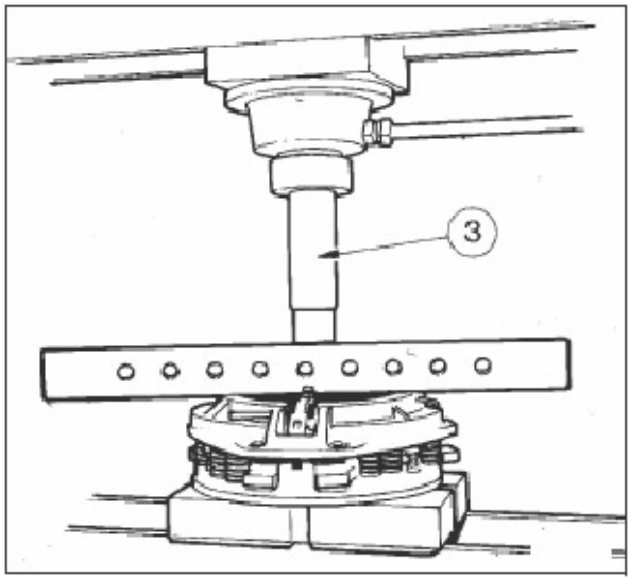


Fig 5

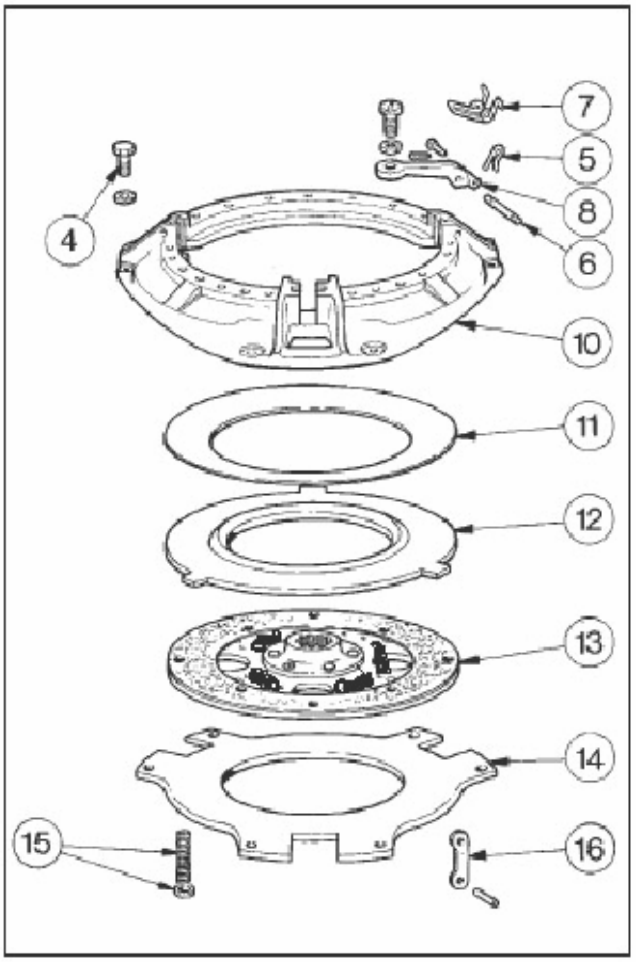


Fig 6

8. Disconnect the release levers from the links. (Item 8 in Fig. 6).
9. Slowly release the pressure from the press until the springs are out of compression.
10. Lift of the cover plate. (Item 10 in Fig. 6).
11. Lift off the Belleville spring. (Item 11 in Fig. 6).
12. Lift off the PTO pressure plate.
13. Lift off the PTO friction disc. (Item 13 in Fig. 6).
14. Lift off the false flywheel. (Item 12 in Fig. 6).
15. Remove the springs and the fiber washers (Item 15 in fig 6).
16. Remove the links.

Examination

Inspect all components for wear, scoring, distortion, cracks, or signs of overheating. Check condition of the Belleville springs.

Flywheel reclamation

If the flywheel is scored, skimming is permissible in 0.010 inch (0.254 mm) increments up to a maximum of 0.039 inch (1.00 mm).

The edge to which the clutch cover is bolted must be skimmed by the same amount to maintain the distance from the clutch face to 1.564 to 1.559 inch (39.75 to 39.62 mm) .

NOTE : *Never, under any circumstances, skim either the false flywheel or the pressure plates as this will severely impair their heat dissipation characteristics.*

Re-assembly

For reassembly follow the reverse procedures given above except,

Fit new springs and fibre washers to the pressure plate as shown in chart

Model	Number of springs	color	Illustration
MF 2605 (2WD and 4WD)	6	Post office Red	A
MF 2615 (2WD and 4WD)	9	Post office Red	B

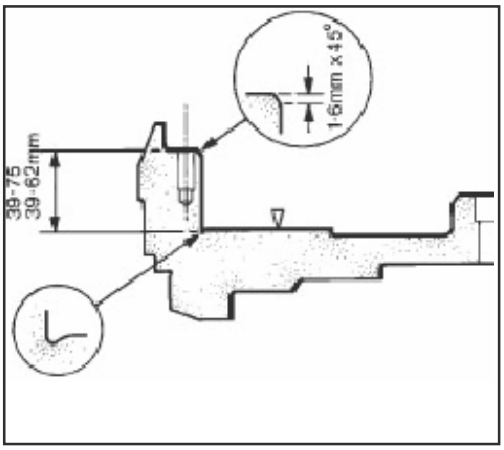
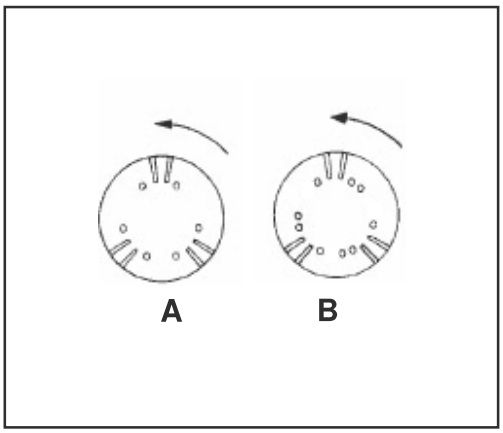


Fig 7



8A. 6 CLUTCH RELEASE BEARING

Removal and Refitment

Special Tool

SER / 054 : Tractor splitting stand

Removal

1. Split the tractor between the engine and transmission.
2. Release the two springs. (Item 1 in Fig. 8).
3. Remove the bearing and carrier assembly. (Item 2 in Fig. 8).
4. Drive out the bearing from the carrier. (Item 3 in Fig. 8).

Refitment

For refitment follow the reverse procedures given above and

1. Press a new bearing onto the carrier.
2. Lightly smear the input shaft splines and the release bearing carrier bore recess with recommended greases.
2. Remove the clutch assembly.
3. Drive out the flywheel pilot bearing from the bearing housing.

8A - 7 CLUTCH RELEASE MECHANISM

Removal and refitment

Removal

1. Split the tractor between the engine and gearbox, see section 4.
2. Remove the two springs.
3. Slide the carrier and release bearing off the input housing.
4. Remove the locking wire and the two locking screws from the release fork.
5. Slacken off the clamp bolt on the clutch pedal lever.
6. Remove the clutch pedal lever.
7. Withdraw the left-hand clutch half shaft from the gearbox casing.
8. Position a suitable drift, through the left-hand clutch shaft bore and carefully drive out the right-hand clutch half shaft.
9. Remove the clutch release fork.
10. Press the release bearing off the carrier.

Refitment

11. Reverse procedures 1 to 10 except:

a. Lubricate the input shaft splines, release bearing carrier bore and release shaft bearings with one of the greases recommended in the specifications section on page 8A - 3.

b. Ensure that the locking screws are located in the holes in the cross shaft.

c. Adjust the clutch pedal clearance, see operation 8A . 3.

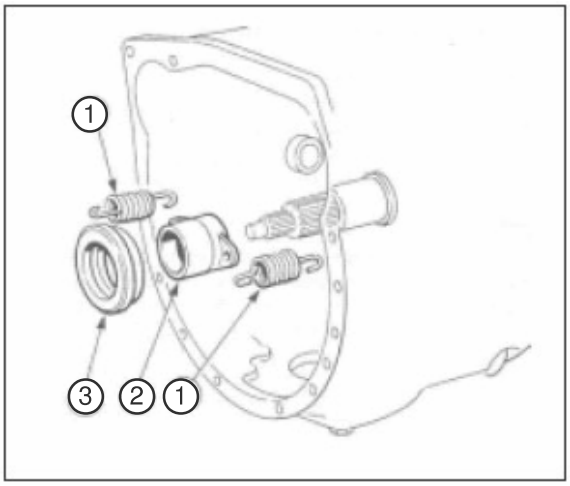


Fig 8

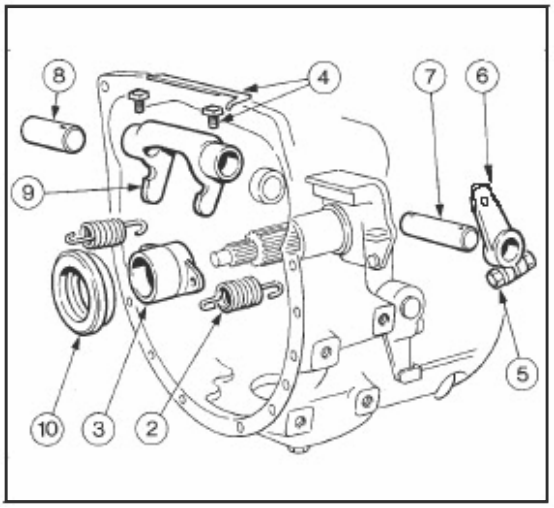


Fig 9

8 A - 8 FLYWHEEL PILOT BEARING

Removal and Refitment

Removal

1. Remove the clutch assembly, see 8B.2 or 8A.5
2. Remove the six bolts and washers.
3. Remove the flywheel.
4. Fill the pilot bearing bore with heavy grease, then insert a suitable length of 0.665 inch (16.9 mm) diameter rod into the pilot bearing bore. Tap the rod sharply to hydraulically eject the bearing.

Refitment

5. Fit a new pilot bearing.
6. Locate the flywheel, aligning the untapped hole in the flange to the unused hole in the flywheel.
7. Fit the flywheel bolts and washers then torque to 100 Nm (74 lbf.ft).
8. Refit the clutch.

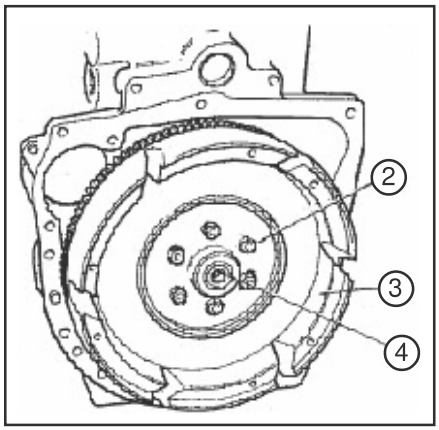


Fig 10

8.A.9 FAULT FINDING :

Symptom	Cause	Remedy
Improper Clutch Function	Oil or grease on friction plate.	Install new friction plate.
	Improper pedal adjustment.	Adjust clutch pedal free travel.
	Damaged pressure plate on clutch cover.	Replace defective part.
	Friction plate hub binding on splined drive pinion.	Clean up splines and smear with small quantity of recommended grease.
	Distorted friction plate.Broken facings on friction plate.	Install new friction plate.
	Dirt or foreign matter in the clutch.	Remove clutch from flywheel and clean with dry rag. See that all working parts are free.
	Rust formation on the clutch / Flywheel interface	Separate transmission case and engine. Clean clutch and flywheel face and assemble.
Clutch slip	Oil or grease on friction plate.	Install new friction plate.
	Weak or soft pressure springs.	Install new pressure springs.
	Bindings or clutch pedal mechanism preventing its full return to stop.	Free bearings. (NOTE : The clutch shaft bearings in the transmission case are self-lubricating. Oil or grease should not be applied).
	Improper pedal adjustment Preventing full engagement.	Adjust clutch pedal free play
	Clutch facing worn.	Install new friction plate.